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10/723,656	11/26/2003	Jose M. Sosa	API-1017-US(COS-919)	8871

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EXAMINER
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ASINOVSKY, OLGA

ART UNIT	PAPER NUMBER
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1711

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/723,656  
Filing Date: November 26, 2003  
Appellant(s): SOSA ET AL.

**MAILED**  
**APR 18 2007**  
**GROUP 1700**

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Tenley R. Krueger  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed January 30, 2006 appealing from the Office action mailed April 18, 2005.

The reply brief filed December 15, 2006 has been entered and considered. The application has been forwarded to the Board of Patent Appeals and Interferences for decision on the appeal.

The examiner's answer is supporting the rejection set forth in the examiner's answer mailed on August 23, 2005.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The amendment after final rejection filed on June 16, 2005 has not been entered.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,433,092	Krupinski et al	8-2002
6,274,641	Krupinski	8-2001
6,420,444	Krupinski	7-2002
6,608,141	Krupinski et al	8-2003
6,166,099	Krupinski	12-2000

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krupinski et al U.S. Patent 6,433,092 or Krupinski U.S. Patent 6,166,099, or Krupinski U.S. Patent 6,274,641, or Krupinski U.S. Patent 6,420,444, or Krupinski et al. U.S. Patent 6,608,141.

Independent claim 1 and dependent claims 2-12 discloses a method for producing an improved copolymerized product comprising: copolymerizing at least one vinylaromatic monomer with at least one diene polymer in the presence of at least one multifunctional initiator selected from the group consisting of trifunctional and

tetrafunctional peroxides, and recovering a copolymerized product that has a ratio of % gel to % rubber (G/R) that increases as swell index increases.

Independent claim 13 and dependent claims 14-25 discloses an improved copolymerized product made by the process comprising: copolymerizing at least one vinylaromatic monomer with at least one diene polymer in the presence of at least one multifunctional initiator selected from the group consisting of trifunctional and tetrafunctional peroxides, and recovering a copolymerized product that has a ratio of % gel to % rubber (G/R) that increases as swell index increases.

Independent claim 26 and dependent claims 27-36 discloses a resin comprising: at least one vinylaromatic monomer, at least one diene polymer; at least one multifunctional initiator selected from the group consisting of trifunctional and tetrafunctional peroxides, where the amount of multifunctional initiator is sufficient to produce a copolymerized product that has a % gel to % rubber (G/R) ratio that increases as swell index increases.

The references of record belong to the same inventor to Krupinski.

Krupinski Patent 6,433,092 (hereinafter Krupinski'092) discloses a process for polymerizing a vinyl aromatic monomer with a rubber polymer in the presence of a tetrafunctional peroxide initiator, column 5, lines 12-13, 22-23 and 31-35. The tetrafunctional initiator such as 1,2,3,4-tetrakis(t-amylperoxycarbonyloxy) butane and the tetrakis (t-C<sub>4-6</sub> alkyl monoperoxycarbonates) are readable in the present claims 5, 17 and 32, see column 9, lines 2-4. The tetrafunctional peroxide initiator is present in an amount from about 100 to 1000 ppm, preferably from about 200 to 400 ppm (0.02 to

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0.044 weight %), column 8, lines 50-64. An amount of the multifunctional initiator in the present claims 7, 19 and 34 is in the range from about 50 to about 1200 ppm, based on the vinylaromatic monomer. Thus, the amount of the multifunctional initiator in Krupinski'092 is within the range in the present claims 7, 19 and 34. The copolymerized product has a polydispersity index in the ranges from 2.38 to 3.97, column 12, Table 1. The polydispersity index is readable in the present claims 12, 21 and 28. The rubber is present in the amount from about 3 to 10% weight based on the total weight of the composition fed to the reactor, column 8, lines 32-35. The amount of rubber in Krupinski'092 is within the range specified in the present claims 9, 23 and 35. The resulting polymer has a melt flow index at condition G (200 C/5 kg) load of less than 5 grams/10 minutes, preferably less than 2.5 grams/10 minutes, column 10, lines 13-16 and claim 9 at column 20. The melt flow index in the range from about 2 is readable in the present claims 2, 14 and 29. The first reaction temperature in the first reaction zone is 100 to 130 C and then in the subsequent reaction zone is relatively higher temperature from about 130 to 160 C, column 9, lines 10-12. The temperature condition in the polymerizing process is readable in the present claims 8 and 22. Using a peroxy carbonate initiator the resulting polymer may have not more than 50 weight % of branched polymer, column 9, lines 19-21. The residence time and the reaction temperature are controlled for producing high impact polystyrene (HIPS), column 9, lines 9-31 and column 8, line 35. The branched resulting polymer is readable in the present claims 6, 18 and 33.

Krupinski Patent 6,166,099 (herein after Krupinski'099) discloses a resin that is high impact polystyrene (HIPS) produced by a process comprising a polymerization of a vinylaromatic monomer in the presence of a tetrafunctional peroxide initiator and a rubbery polymer. The process conditions for producing the resulting polymer are substantially the same that are in the Krupinski'092 invention discussed above. See Krupinski'099, column 2, lines 57, 63-66; column 3, lines 58-66; column 5, lines 27-48 and 54-67; column 6, lines 62-64; column 9, Table 1 for polydispersity index and melt flow condition. The rubbery polymer is present in an amount from 3 to 10 weight %, claim 12 at column 12. A cell foam product is an article for the present claim 36.

Krupinski Patent 6,274,641 (hereinafter Krupinski'641) discloses a process for preparing a closed cell foam=article such that said article is produced by polymerizing a vinylaromatic monomer in the presence of a tetrafunctional peroxide initiator and a rubbery polymer. The resulting polymer is high impact polystyrene (HIPS). The process conditions for producing HIPS are substantially the same as in Krupinski'092 invention. See Krupinski'641 column 2, lines 59, 65-66; column 4, lines 37-38; column 5, lines 35-66 and column 6, lines 3-8 and 38-45; column 9, Table 1 for polydispersity index and melt flow condition. The rubber polymer is present in an amount from 3 to 10 weight %, column 12, claim 21.

Krupinski Patent 6,420,444 (hereinafter Krupinski'444) discloses styrenic polymer produced by polymerizing styrene monomer with a rubbery polymer in the presence of a

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tetrafunctional peroxide initiator. See Krupinski'444 column 2, lines 59-66; column 3, lines 59-65; column 4, lines 63-67; column 5, lines 10-67; column 6, lines 62-67 and column 9, Table 1 for the polydispersity index and melt flow condition.

Krupinski patent 6,608,141 (hereinafter Krupinski'141) discloses a polystyrene article comprising high impact polystyrene (HIPS) produced by polymerizing a vinylaromatic monomer with a rubbery polymer in the presence of a tetrafunctional peroxide initiator. See Krupinski'141 column 4, lines 57-66, column 5, lines 34-66; column 6, lines 20-25; column 7, lines 56-60; column 8, lines 40-60; column 9, lines 6-30 and column 13, Table 1 for polydispersity index and melt flow condition.

All patents to Krupinski disclose a process for producing high impact polystyrene.

The difference between the present claims and each cited Patent to Krupinski is the requirement in the present claims that a resulting copolymerized product has a ratio of % gel to % rubber (G/R) that increases as swell index increases. It would have been obvious to one of ordinary skill in the art to consider that the ratio of % gel to % rubber can be obtained in each Patent to Krupinski invention because each reference discloses a process for making a HIPS wherein the process conditions are controlled by the residence time and the reaction temperature in the presence of the same tetrafunctional peroxide initiator and the amount of said tetrafunctional initiator and the amount of rubber polymer, such that all limitations of the process conditions are readable in the present claims. The term "improved" in the present claims 1 and 13 would be readable for HIPS having high tensile strength in each Krupinski invention (see Krupinski'092,



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col. 16, lines 31-40). The prima facie case of obviousness is that the analogous process condition for producing a HIPS in the presence of the same tetrafunctional peroxide initiator in each Krupinski invention can produced a high gel value of a rubber, and, thereby, high swell index will occur in each Krupinski invention.

#### **(10) Response to Argument**

Appellant's argument is that none in Krupinski invention teaches or suggests a ratio of % gel to % rubber (G/R) that increases as the swell index increases, as recited in the pending claims. References do not use the phrase that a "(G/R) increases as swell index increases." The key of the invention is to use a multifunctional initiator selected from the group consisting of trifunctional and tetrafunctional peroxides to control the gel and swell index. The rubber having a high gel value is a benefit to control the elasticity of HIPS product. Each Krupinski invention discloses the same tetrafunctional peroxide initiator being present in the amount within the range specified in the present claims 7, 19 and 34. The amount of rubber polymer from 3 to 10 wt.% is within in the range specified in the present claims 9, 23 and 35. Each Krupinski invention discloses the analogous process conditions for producing HIPS product. The polydispersity index and a melt flow index in the resulting HIPS product in each Krupinski invention are readable in the present claims. The claimed "increase the swell index" will occur in each Krupinski invention for being similar to the present claims in the absence of evidence to the contrary. In light of the similarity of the properties of the HIPS in each Krupinski invention, the resulting product will have the same function as a ratio of % gel to %

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
rubber (G/R) that increases as swell index increases. In view of the foregoing, each Krupinski's teaching does render the process and the composition of the instant claims obvious.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.


Respectfully submitted,

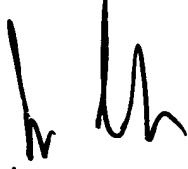
  
O. Asinovsky

April 13, 2007

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